BUSINESS SCHEME ANALYSIS FOR LANDING GEAR OVERHAUL BOEING 737-800 NG BETWEEN PT. GMF AERO ASIA AND PT. GARUDA INDONESIA

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PRESENTATION OUTLINE

PROBLEM BACKGROUND

OBJECTIVES , ASSUMPTIONS AND BOUNDARIES

RESEARCH METHODOLOGY

BUSINESS SCHEME ANALYSIS USING EACH PERSPECTIVE

FAIR BUSINESS SCHEME ANALYSIS

RISKS IDENTIFICATION AND MITIGATION SCHEMES

CONCLUSIONS AND SUGGESTIONS

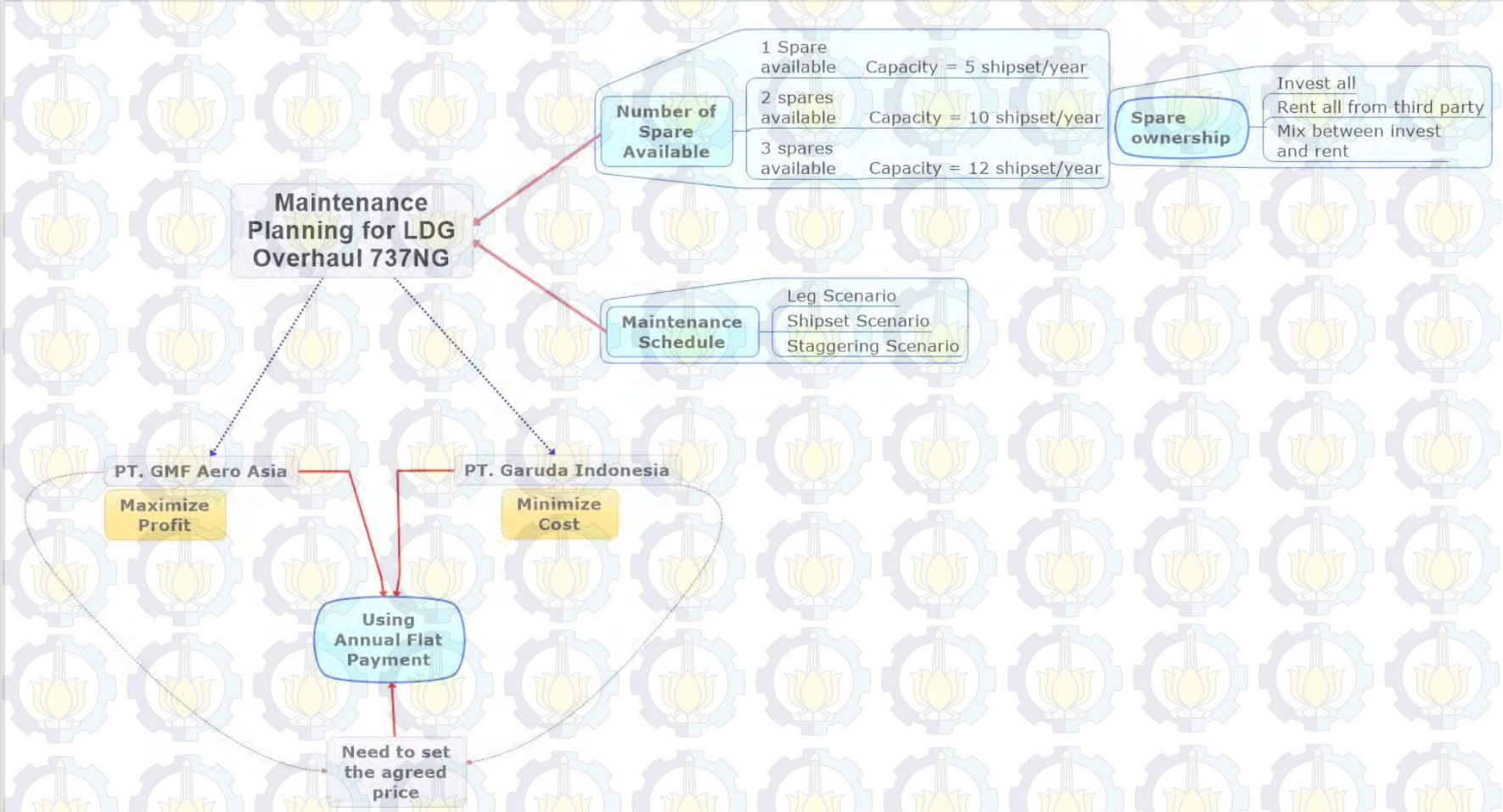
BACKGROUND

2018 — Maintenance Planning For Landing Gear Overhaul of Boeing 737-800 NG — 2021

65 aircrafts

- Maintenance Schedule
- Number of Spare
- Spare ownership

BACKGROUND


Maintenance Planning for LDG Overhaul 737NG
Number of Spare Available
1 Spare available
Capacity = 5 shipset/year
2 spares available
Capacity = 10 shipset/year
3 spares available
Capacity = 12 shipset/year
Spare ownership
Invest all
Rent all from third party
Mix between invest and rent
Maintenance Schedule
Leg Scenario
Shipset Scenario
Staggering Scenario
PT. GMF Aero Asia
Maximize Profit
PT. Garuda Indonesia
Minimize Cost
Using Annual Flat Payment
Need to set the agreed price

RESEARCH OBJECTIVE

The objective of this research are,

1. To analyze business scheme that will give best advantages for PT. GMF Aero Asia and PT Garuda Indonesia in maintenance planning landing gear overhaul Boeing 737-800 NG by using each preferences.
2. To give recommendation for the fair scheme based on the negotiation range in overhaul Landing Gear 737-800NG between PT. GMF Aero Asia and PT. Garuda Indonesia.
3. Identify risks and suggest mitigation scheme from the proposed scheme for both PT. Garuda Indonesia and PT. GMF Aero Asia.

RESEARCH SCOPE

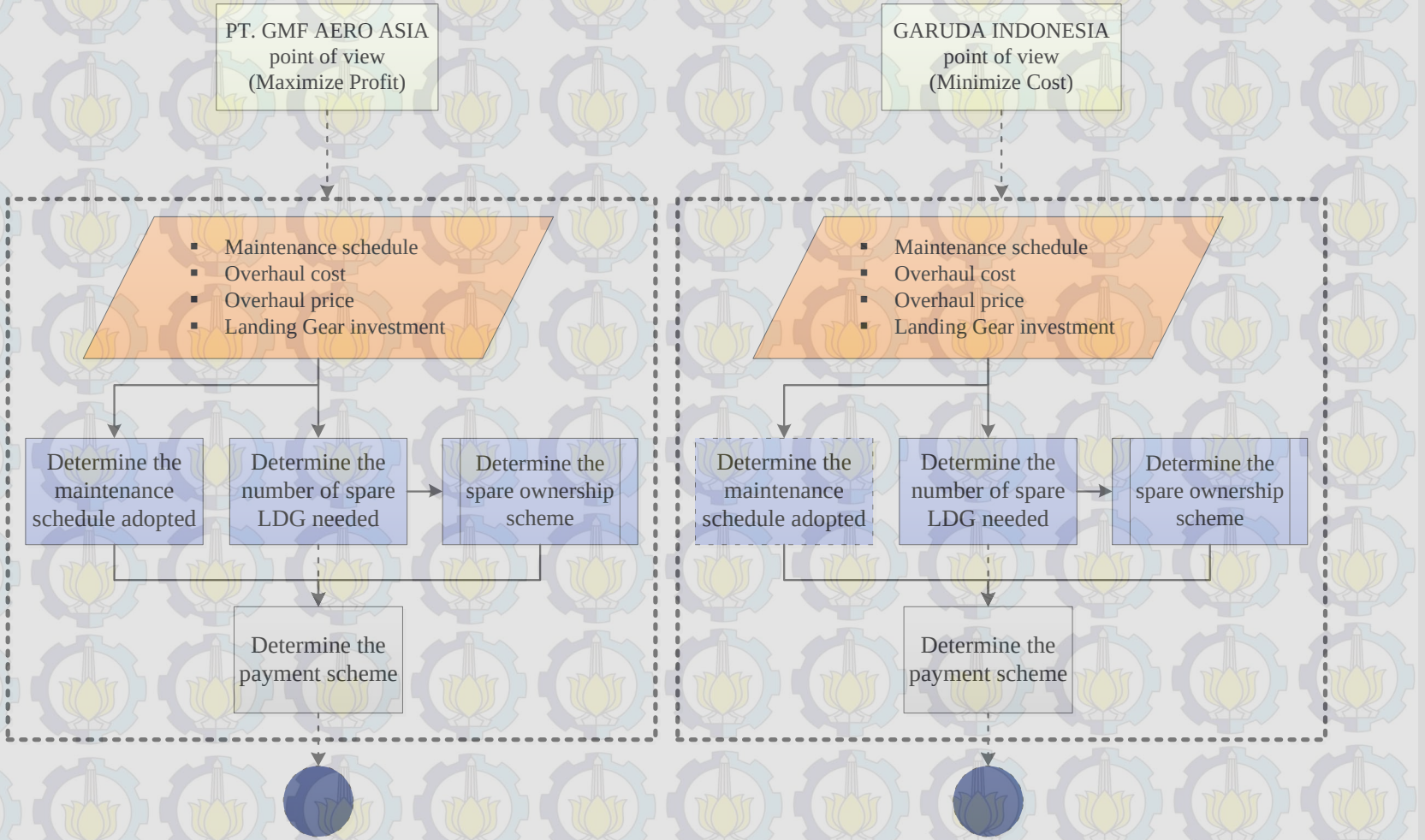
Assumptions

- The Interest rate for dollar deposit assumed at 2% p.a.
- Escalation rate is 4.5% p.a.

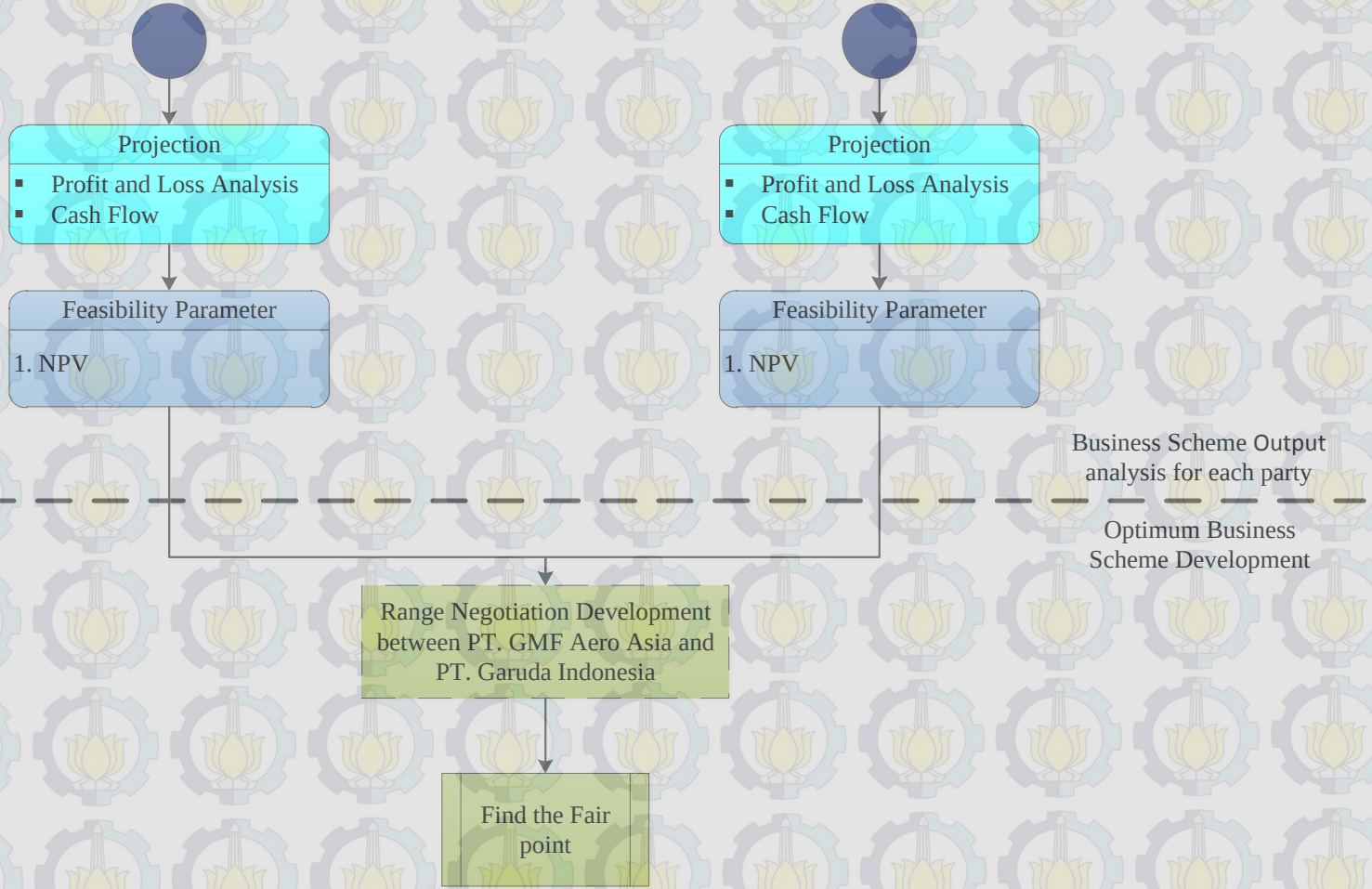
Boundaries

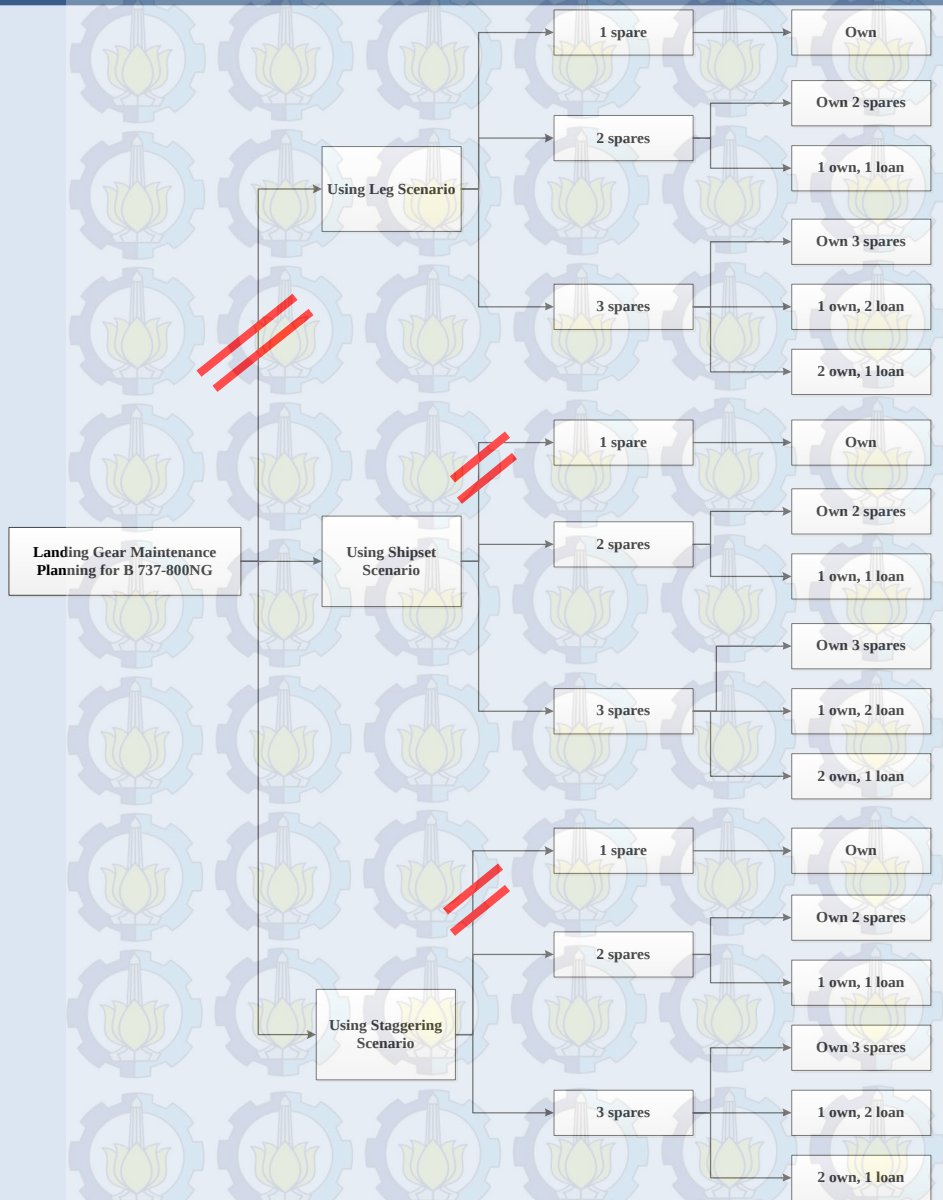
- The business development between PT. GMF Aero Asia and PT. Garuda Indonesia is for overhaul landing gear B737-800 NG.
- The maximum spare can be provided is three spares, according to the workshop capacity
- Data for overhaul landing gear refers from Garuda is started in 2018 until 2021. Time span used for analyze the business development is 8 years.
- There is no investment needed for the workers and facility, because GMF already has the capability. Investment only needed to purchase the Landing Gear spare.

RESEARCH METHODOLOGY



RESEARCH METHODOLOGY





BUSINESS SCHEME ANALYSIS

Domination

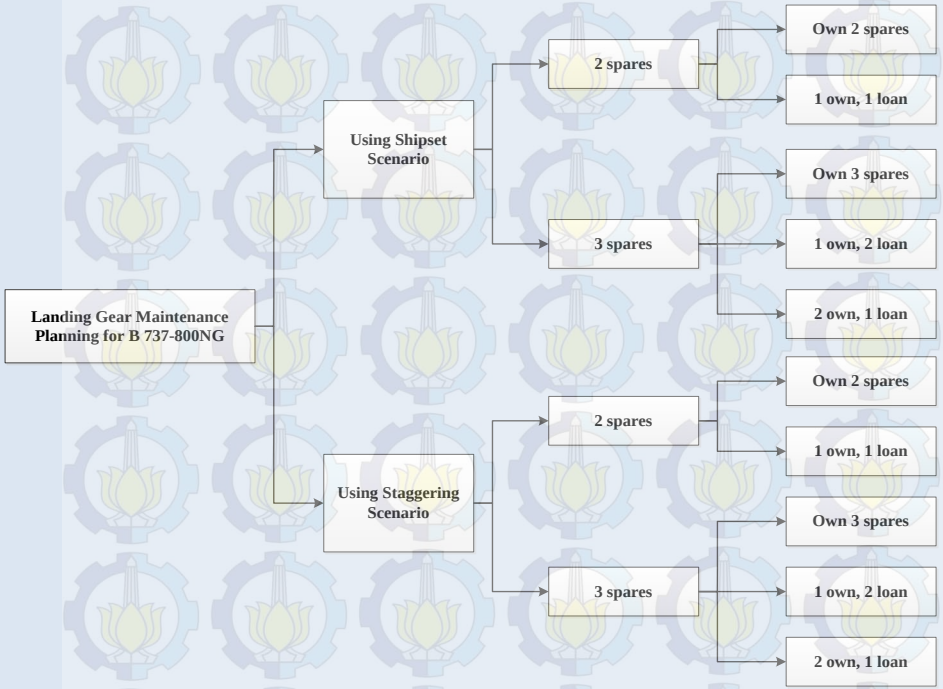
Maintenance Schedule

Shipset Scenario
Staggering Scenario >>> Leg Scenario

Number of Spare Provided

Two Spares
Three Spares >>> One Spare

BUSINESS SCHEME ANALYSIS



- Scheme 1
- Scheme 2
- Scheme 3
- Scheme 4
- Scheme 5
- Scheme 6
- Scheme 7
- Scheme 8
- Scheme 9
- Scheme 10

BUSINESS SCHEME ANALYSIS GMF AERO ASIA PERSPECTIVE

Scheme 1

Shipset Scenario

Two LDG Spares --- 10 LDGs per year

One LDG invest and One LDG rent

Cash Inflow

- Revenue from maintenance fee
- Revenue from availability fee
- Revenue from other service
- LDG salvage value
- LDG rent payment from Garuda Indonesia

Cash Outflow

- LDG procurement
- Cost of Poor Quality (COPQ)
- Man-hour costs
- Material cost
- LDG rent payment from Garuda Indonesia
- General and administration cost
- Insurance Cost

BUSINESS SCHEME ANALYSIS GMF AERO ASIA PERSPECTIVE

Scheme 1

LDG Purchased							
2014	2015	2016	2017	2018	2019	2020	2021
1	0	0	0	0	0	0	0
Number of Landing Gear Overhauled							
2014	2015	2016	2017	2018	2019	2020	2021
0	0	0	1	12	12	9	8

Inflow	2014	2015	2016	2017	2018	2019	2020	2021
Ovehaul Maintenance Cost (USD)	-	-	-	451,902	5,666,848	5,921,857	4,641,255	4,311,210
Availability Fee (USD)	487,241	487,241	487,241	487,241	487,241	487,241	487,241	487,241
Revenue from Other Service (USD)	-	-	-	-	50,000	50,000	50,000	50,000
Salvage Value (USD)	-	-	-	-	-	-	-	-
Loan Payment from Garuda	-	-	-	-	882,000.00	882,000.00	504,000.00	378,000.00
Total Cash Inflows	**487,241**	**487,241**	**487,241**	**939,143**	**7,086,090**	**7,341,098**	**5,682,496**	**5,226,452**

Outflow	2014	2015	2016	2017	2018	2019	2020	2021
LDG Procurement (USD)	(2,800,000)	-	-		-	-	-	-
Cost Of Poor Quality (0.03% from revenue)	-	-	-	-	(2,126)	(2,202)	(1,705)	(1,568)
Manhours cost (USD)	-	-	-	(19,582)	(245,563)	(256,614)	(201,121)	(186,819)
Maintenance cost per event (USD)	-	-	-	(306,973.69)	(3,849,450.04)	(4,022,675.29)	(3,152,771.76)	(2,928,574.66)
Loan Payment	-	-	-	-	(882,000.00)	(882,000.00)	(504,000.00)	(378,000.00)
General & Administration cost	-	-	-	(47,896.30)	(361,390.58)	(374,395.99)	(289,807.32)	(266,549.03)
Insurance Cost	-	-	-	(18,782.86)	(141,721.79)	(146,821.96)	(113,649.93)	(104,529.03)
Total Cash Outflows	**(2,800,000)**	**-**	**-**	**(393,235)**	**(5,482,252)**	**(5,684,709)**	**(4,263,055)**	**(3,866,040)**

BUSINESS SCHEME ANALYSIS GMF AERO ASIA PERSPECTIVE

Scheme 1

Year	2014	2015	2016	2017	2018	2019	2020	2021
Gross Profit	**(2,312,759)**	**487,241**	**487,241**	**545,908**	**1,603,838**	**1,656,389**	**1,419,442**	**1,360,412**
Depreciation	-	-	-	-	-	-	-	-
EBIT	(2,312,759)	487,241	487,241	545,908	1,603,838	1,656,389	1,419,442	1,360,412
Interest Expense	-	-	-	-	-	-	-	-
EBT	(2,312,759)	487,241	487,241	545,908	1,603,838	1,656,389	1,419,442	1,360,412
TAX (25%)	-	(121,810.33)	(121,810.33)	(136,476.96)	(400,959.51)	(414,097.13)	(354,860.40)	(340,102.96)
Earning After Tax (Net Profit)	**(2,312,759)**	**365,431**	**365,431**	**409,431**	**1,202,879**	**1,242,291**	**1,064,581**	**1,020,309**
Depreciation	-	-	-	-	-	-	-	-
Principal Payment		-	-	-	-	-	-	-
Net Cash Flows	**(2,312,759)**	**365,431**	**365,431**	**409,431**	**1,202,879**	**1,242,291**	**1,064,581**	**1,020,309**

NPV	$1,536,817

BUSINESS SCHEME ANALYSIS GMF AERO ASIA PERSPECTIVE

GMF Aero Asia's Objective : Maximize Profit

Scenario	Maintenance Schedule	Number of spares	Ownership	NPV Value
1	Shipset	2	1 invest; 1 rent	$ 1,384,449
2	Shipset	2	All invest	$ 1,850,688
3	Shipset	3	All invest	$ 1,406,201
4	Shipset	3	2 invest; 1 rent	$ 2,027,901
5	Shipset	3	1 invest; 2 rent	$ 1,536,817
6	Staggering	2	1 invest; 1 rent	$ 1,682,567
7	Staggering	2	All invest	$ 2,183,711
8	Staggering	3	All invest	$ 1,851,030
9	Staggering	3	2 invest; 1 rent	$ 2,361,523
10	Staggering	3	1 invest; 2 rent	$ 1,860,379

BEST SCHEME

BUSINESS SCHEME ANALYSIS GARUDA INDONESIA PERSPECTIVE

Scheme 1

Shipset Scenario

Two LDG Spares --- 10 LDGs per year

One LDG invest and One LDG rent

Cash Inflow

- LDG spare Salvage Value

Cash Outflow

- Maintenance Fee Payment
- Availability Fee Payment
- LDG rent fee payment
- Offload-work maintenance payment

BUSINESS SCHEME ANALYSIS GARUDA INDONESIA PERSPECTIVE

Scheme 1

	Number of Landing Gear Overhauled							
	2014	2015	2016	2017	2018	2019	2020	2021
	0	0	0	1	10	10	9	8
Inflow	2014	2015	2016	2017	2018	2019	2020	2021
Salvage Value	0	0	0	0	0	0	0	1,036,000
Total Cash Inflows	-	-	-	-	-	-	-	**1,036,000**
Outflow	2014	2015	2016	2017	2018	2019	2020	2021
Maintenance Fee Payment to GMF	(2,531,066)	(2,531,066)	(2,531,066)	(2,531,066)	(2,531,066)	(2,531,066)	(2,531,066)	(2,531,066)
Maintenance Fee Payment to Third Party	-	-	-	-	(802,200)	(4,011,000)	-	-
Availability Fee Payment	(487,241)	(487,241)	(487,241)	(487,241)	(487,241)	(487,241)	(487,241)	(487,241)
Spare Rent Fee Payment	-	-	-	-	(630,000)	(630,000)	(504,000)	(378,000)
Total Cash Outflows	**(3,018,308)**	**(3,018,308)**	**(3,018,308)**	**(3,018,308)**	**(4,450,508)**	**(7,659,308)**	**(3,522,308)**	**(3,396,308)**

BUSINESS SCHEME ANALYSIS GARUDA INDONESIA PERSPECTIVE

Scheme 1

Year	2014	2015	2016	2017	2018	2019	2020	2021
Gross Profit	(3,018,308)	(3,018,308)	(3,018,308)	(3,018,308)	(4,450,508)	(7,659,308)	(3,522,308)	(2,360,308)
Depreciation	-	(252,000)	(252,000)	(252,000)	(252,000)	(252,000)	(252,000)	(252,000)
EBIT	(3,018,308)	(3,270,308)	(3,270,308)	(3,270,308)	(4,702,508)	(7,911,308)	(3,774,308)	(2,612,308)
Interest Expense	-	-	-	-	-	-	-	-
EBT	-	-	-	-	-	-	-	-
TAX (25%)	-	-	-	-	-	-	-	-
Earning After Tax (Net Profit)	(3,018,308)	(3,270,308)	(3,270,308)	(3,270,308)	(4,702,508)	(7,911,308)	(3,774,308)	(2,612,308)
Depreciation	-	252,000	252,000	252,000	252,000	252,000	252,000	252,000
Principal Payment	-	-	-	-	-	-	-	-
Net Cash Flows	(3,018,308)	(3,018,308)	(3,018,308)	(3,018,308)	(4,450,508)	(7,659,308)	(3,522,308)	(2,360,308)

NPV	$ (22,397,875)

BUSINESS SCHEME ANALYSIS GARUDA INDONESIA PERSPECTIVE

Garuda Indonesia's Objective : Minimize Cost

Scenario	Maintenance Schedule	Number of spares	Ownership	NPV Value
1	Shipset	2	1 invest; 1 rent	($22,397,875)
2	Shipset	2	All invest	($22,568,239)
3	Shipset	3	All invest	($24,240,265)
4	Shipset	3	2 invest; 1 rent	($25,110,302)
5	Shipset	3	1 invest; 2 rent	($23,578,078)
6	Staggering	2	1 invest; 1 rent	($23,382,045)
7	Staggering	2	All invest	($23,595,944)
8	Staggering	3	All invest	($24,904,502)
9	Staggering	3	2 invest; 1 rent	($25,627,499)
10	Staggering	3	1 invest; 2 rent	($22,660,869)

BEST SCHEME

FAIR BUSINESS SCHEME ANALYSIS

Shipset Schedule
Two LDG Spares
One invest ; One rent

No	Scheme GIA	NPV GIA	Scheme GMF	NPV GMF
1	1	$ (22,397,874.87)	1	$ 1,384,448.66
3	2	$ (22,568,239.37)	2	$ 1,850,089.22
4	3	$ (24,240,264.65)	3	$ 1,406,200.62
5	4	$ (25,110,301.61)	4	$ 2,027,900.66
6	5	$ (23,578,077.85)	5	$ 1,536,817.08
2	6	$ (23,382,045.46)	6	$ 1,682,567.37
9	7	$ (23,595,943.96)	7	$ 2,183,711.30
8	8	$ (24,904,501.98)	8	$ 1,851,030.06
10	9	$ (25,627,499.36)	9	$ 2,361,522.73
7	10	$ (22,660,869.25)	10	$ 1,860,378.80

Staggering Schedule
Three LDG Spares
Two invest ; One rent

FAIR BUSINESS SCHEME ANALYSIS

Fair business scheme :

- Gives **advantage for both** Garuda Indonesia and GMF Aero Asia.
- Gives advantage for **GMF Aero Asia in terms of maximize profit**. Otherwise, **Garuda Indonesia does not have to spend a lot of money to pay GMF Aero Asia.**
- Gives advantage for **Garuda Indonesia to minimize cost**. Otherwise, **GMF Aero Asia does not have to burden for the low profit generated**.

FAIR BUSINESS SCHEME ANALYSIS

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scheme
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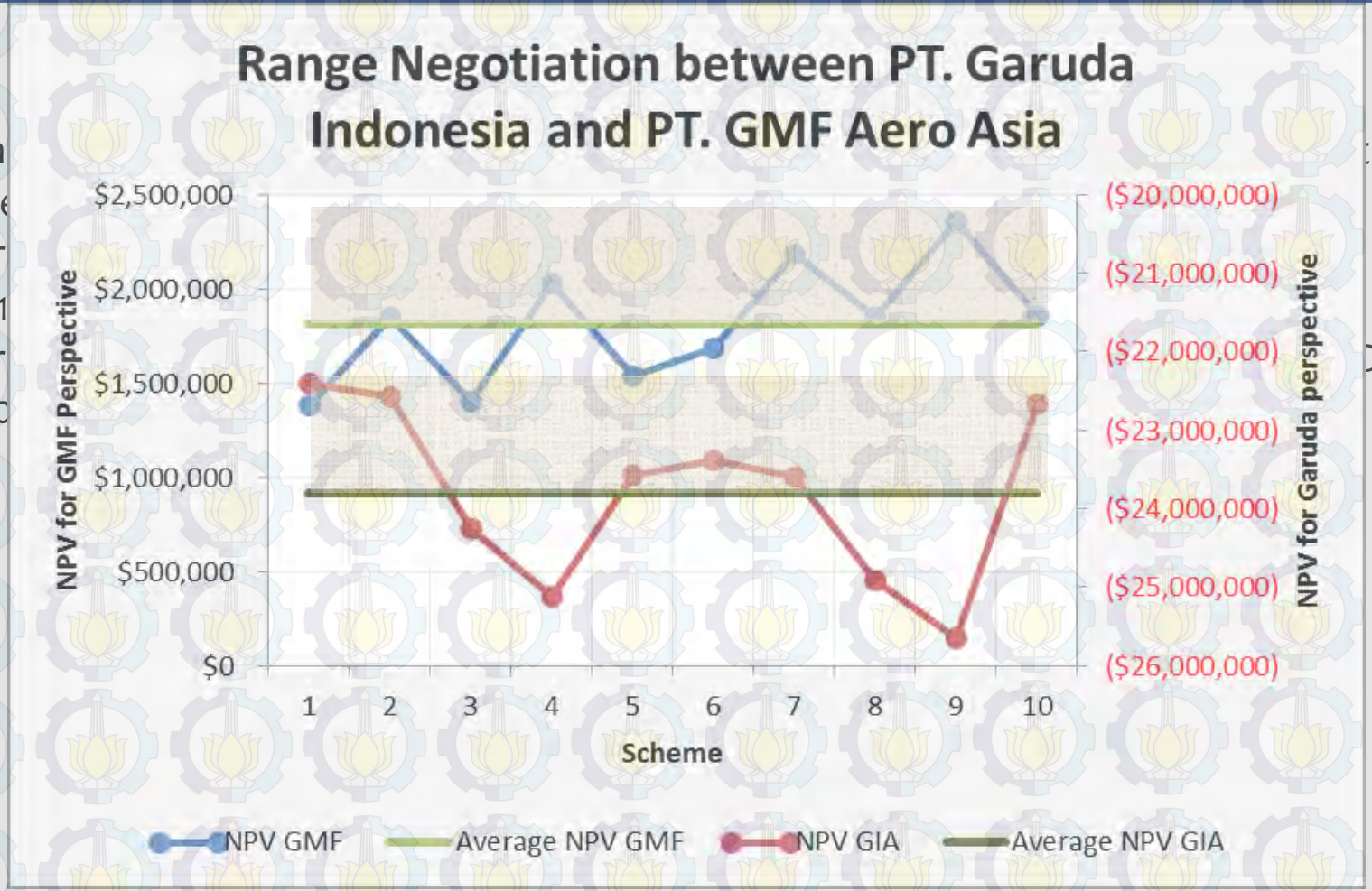


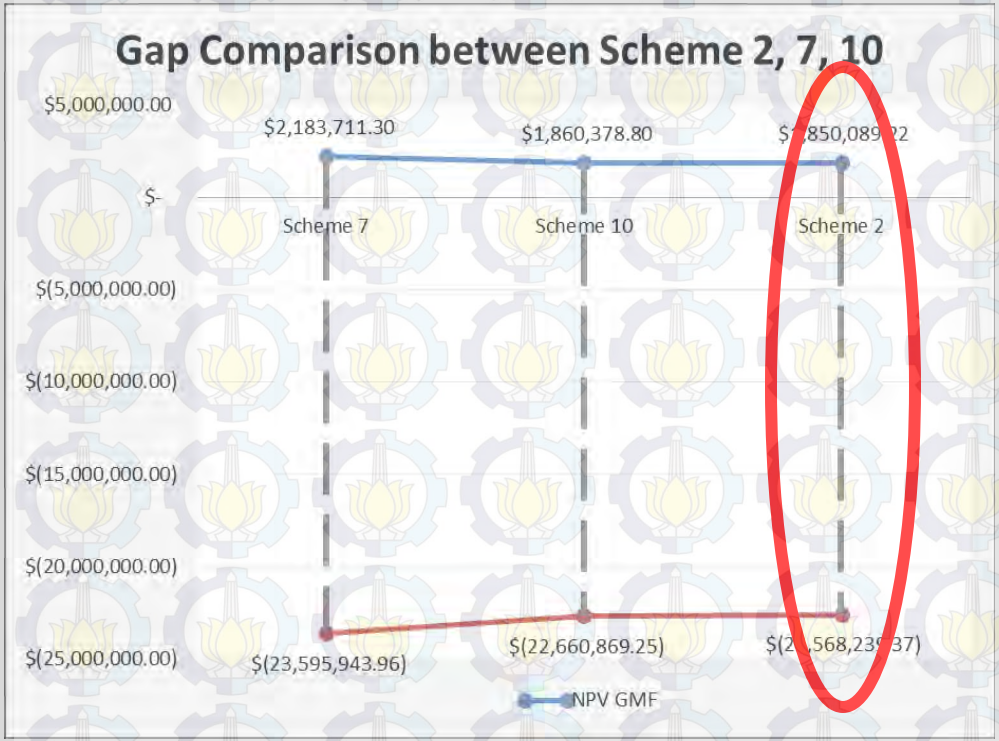
FAIR BUSINESS SCHEME ANALYSIS

Scenario	NPV Value for GMF	Scenario	NPV Value Garuda
2	$ 1,850,089	1	$ (22,397,874)
4	$ 2,027,901	2	$ (22,568,239)
7	$ 2,183,711	5	$ (22,578,077)
8	$ 1,851,030	6	$ (23,382,045)
9	$ 2,361,523	7	$ (23,595,943)
10	$ 1,860,379	10	$ (22,660,869)

Scenario	NPV Value for GMF	Scenario	NPV Value Garuda
2	$ 1,850,089	2	$ (22,568,239)
7	$ 2,183,711	7	$ (23,595,943)
10	$ 1,860,379	10	$ (22,660,869)

From three scenarios, **gap comparison** is used to choose which scheme is the most fair.

FAIR BUSINESS SCHEME ANALYSIS



Scheme	NPV Value
Scheme 2	$ 24,418,328
Scheme 7	$ 25,779,655
Scheme 10	$ 24,521,248

Gap value represents how big is the profit generated by GMF and how big is the cost spend by Garuda.

RISK IDENTIFICATION AND MITIGATION SCHEMES -- GMF

GMF Aero Asia objective :

1. As the service provider, GMF has set a minimum profit that can be expected to gain. GMF set an objective that the minimum profit GMF must gain is USD 1,300,000.
2. GMF also concern to maximize the utilization of line capacity and the spare. Utilization is influenced by the demand from Garuda.

Risks Identification and the Mitigation action on scheme 2 - using GMF Aero Asia Perspective					
Objective :	1. Minimum Profit generated by GMF Aero Asia is USD 1,300,000 2. Maximize the Utilization of workshop and LDG Spare				
Risk ID	**Risk Identification**	**Context**		**Mitigation**	**Impact**
GMF1	Overhaul Price (USD)	In contract, overhaul price rate is USD 396,000. Garuda as the parent company negotiate to change the price because it is considered too high.	1	Offer Garuda to use overhaul base price as the same with the competitor's **price USD 401,000**	NPV value from profit generated increase to USD 2,114,624
			2	Offer Garuda to use overhaul base price as the same with current price (28% profit margin from total cost) **USD 396,000**	NPV value from profit generated is the same as expected, USD 1,875,688
			3	Use **USD 368,010** as overhaul base price - against objective #1	NPV from profit will drop from USD 1,875,688 to USD 1,300,000 (minimum profit expected)

RISK IDENTIFICATION AND MITIGATION SCHEMES -- GMF

Risks Identification and the Mitigation action on scheme 2 - using GMF Aero Asia Perspective					
Objective :	1. Minimum Profit generated by GMF Aero Asia is USD 1,300,000 2. Maximize the Utilization of workshop and LDG Spare				
Risk ID	**Risk Identification**	**Context**		**Mitigation**	**Impact**
GMF2	Overhaul Even or Demand	In contract, there are 50 aircrafts agreed will be overhauled. Garuda decide to cancel 15 schedules of overhaul	1	When materials are not delivered yet -- penalty cost charged is **labor cost + cancellation fee 10% overhaul cost** per even cancellation	NPV from profit equals to USD 1,566,808
			2	When materials already received -- penalty cost charged is **labor cost + material cost + cancellation fee 10% overhaul costs** per even cancellation	NPV from profit equals to USD 1,764,160
			3	Charge Garuda Indonesia **USD 500,000** for total 15 cancellation -- Against objective #1 and #2	NPV value from profit equals to USD 1,833,509
GMF3	G&A Cost	Current rate, G&A rate is 5.1%. There is possibility that the real expenditure exceed 5.1%	1	**Control expenditure** regarding G&A cost, do not exceed 9.93% from total revenue - against objective #1	Reduce G&A cost will increase the gross profit.

RISK IDENTIFICATION AND MITIGATION SCHEMES -- GMF

Risks Identification and the Mitigation action on scheme 2 - using GMF Aero Asia Perspective					
Objective :	1. Minimum Profit generated by GMF Aero Asia is USD 1,300,000				
	2. Maximize the Utilization of workshop and LDG Spare				
Risk ID	**Risk Identification**	**Context**		**Mitigation**	**Impact**
GMF4	Escalation Rate	The current agreement is using 4.5% as the rate. There is possibility that the exisitng rate is higher or lower than the agreed rate.	1	Use the rate at **4.5%** (contract)	The probability of inflation rate in below 4.5% is 89%. When the real inflation rate incrase to 6.12%, the NPV from profit decrease to USD 1,300,000
			2	Use the rate at **3.5%** p.a	The probability of inflation rate above 3.5% is high, 20.59%.
			3	**Floating** escalation rate follows the inflation in United States	Escalation rate follows U.S inflation rate per year.
GMF5	Inreasing Labor Rate	Curent labor rate is USD 30 per hour,. There is possibility that the workers ask to renegotiate the labor rate.	1	Offer man-hour cost in base rate **USD 30** (contract)	NPV value from profit generated is the same as expected, USD 1,875,688
			2	Offer man-hour cost in base rate **USD 39** (ARG/US aircraft rate for airframe mechanical)	NPV value from profit generated is the same as expected, USD 1,761,678
			3	Offer man-hour cost in base rate **USD 75** -- against objective #1	This rate is too high if compared with rate that used in europe for engine and powerplant mechanical USD 53-67 perhour. Using rate USD 75 per hour will reduce NPV to USD 1,300,000
GMF6	Material Cost	There is possibility that the material cost is higher than the forecaste at rate USD 269,000	1	Make contract with supplier, agreed upon current base material price **USD 269,000**	NPV value from profit is the same as expected, USD 1,875,688
			2	Make contract with the supplier, agreed new the material price --> **USD 269,000 +5%**	Using base material rate USD 294,994 will reduce NPV to USD 1,577,819
			3	Make contract with the supplier, agreed new the material price --> **USD 269,000 +10%** - Against objective #1	Using base material rate USD 294,994 will reduce NPV to USD 1,300,000

RISK IDENTIFICATION AND MITIGATION SCHEMES -- GARUDA

Garuda Indonesia's objective :

1. As the customer from GMF, Garuda Indonesia has set maximum cost that can be accepted (USD 26,000,000).
2. Garuda Indonesia also concern to maximize the number of aircraft that overhauled by Garuda. The number of overhauled LDG depends on the capacity of GMF Aero Asia.

Risks Identification and the Mitigation action on scheme 2 - using Garuda Indonesia Perspective					
Objective :	**1. Maximum Cost spend by Garuda Indonesia is (USD 26,000,000)**				
	2. Maximize number of aircrafts that done overhaul in GMF Aero Asia				
Risk ID	**Risk Identification**	**Context**		**Mitigation**	**Impact**
GIA1	Overhaul Price Negotiation (USD)	GMF Aero Asia as the service provider want to renogitiate the overhaul price.	1	Use overhaul base price at **USD 396,000** per even overhaul as the same in contract	NPV value from cost spend by Garuda is the same as expexted, (USD 22,568,239)
			2	Use overhaul base price at **USD 401,100** per even overhaul, same price with the competitor price	NPV value from cost spend by Garuda will increase to (USD 22,755,563)
			3	Use **USD 489,431** as overhaul base price - maximum rate allowed which against objective #1	NPV value from cost increased to (USD 26,000,000) -- (maximum cost accepted)

RISK IDENTIFICATION AND MITIGATION SCHEMES -- GARUDA

Risks Identification and the Mitigation action on scheme 2 - using Garuda Indonesia Perspective					
Objective :	**1. Maximum Cost spend by Garuda Indonesia is (USD 26,000,000)**				
	2. Maximize number of aircrafts that done overhaul in GMF Aero Asia				
Risk ID	**Risk Identification**	**Context**		**Mitigation**	**Impact**
GIA2	Overhaul demand increase to 62 aircrafts	In the existing contract, there are 50 aircraft will be overhauled. There is unexpected 12 more aircraft needs to overhauled.	1	Ask to change maintenance schedule to **staggering Scenario** with the same spare available	NPV value from cost decrease to (USD 23,986,711)
			2	Use **current scheme** -- against objective #1 and #2	NPV value from cost increased to (USD 26,000,000) -- (maximum cost accepted)
GIA3	Escalation Rate	GMF Aero Asia as the service provider want to renogitiate the overhaul rate.	1	Use the rate at **3%**	NPV value from cost decrease to (USD 21,431,892)
			2	Use the rate at **4.5%** (contract)	NPV value from cost spend by Garuda is the same as expexted, (USD 22,568,239)
			3	**Floating** escalation rate follows the inflation in United States	Escalation rate follows U.S inflation rate per year.

CONCLUSIONS AND SUGGESTIONS

Conclusion :

1. **Best scheme for GMF Aero Asia is Scheme nine** which generates highest profit. **The NPV projected in scheme nine is USD 2,361,523.**
   Best scheme for Garuda Indonesia to adopt is scheme one. This scheme generates the lowest cost for Garuda Indonesia **with NPV equals to ($22,397,875).**
2. From the **range negotiation** between Garuda and GMF, **scheme two is chosen to be the proposed fair-scheme.** For Garuda Indonesia, using scheme two will give cost (USD 22,568,239) and gives profit to GMF Aero Asia USD 1,850,089.

CONCLUSIONS AND SUGGESTIONS

3. **In Garuda Indonesia perspective**, the objective is to **minimize cost** and set the **maximum accepted cost is (USD 26,000,000)**. After tested, the **sensitive factors** that possibly change the expected output from scheme two are number of **landing gear even (aircraft), escalation rate, and the overhaul price charged from GMF Aero Asia**. To minimize the impact, mitigation scheme is developed by considering the critical point that against the objective of maximum cost (USD 26,000,000)
   For **GMF Aero Asia perspective, the objective is to maximize profit** and set the **minimum accepted profit is USD 1,300,000**. The **sensitive factors** that possibly change the expected output from scheme two are **overhaul price, material price, labor rate, G&A cost, escalation rate, and number of overhaul demand**. To minimize the impact, mitigation scenario is developed by considering the critical point for each parameter against the objective of minimum profit USD 1,300,000.

CONCLUSIONS AND SUGGESTIONS

There are several suggestions for future research,

1. In this research, the risk management is not done respectively follows the standard. Thus, it is suggested that in next research the risk management can be prepared in complete procedure.
2. For GMF Aero Asia and Garuda Indonesia, it is better for further business scheme development is considering the fairness output for both objectives. Hence, both parties still can satisfy their objectives by not giving loss for the other party.

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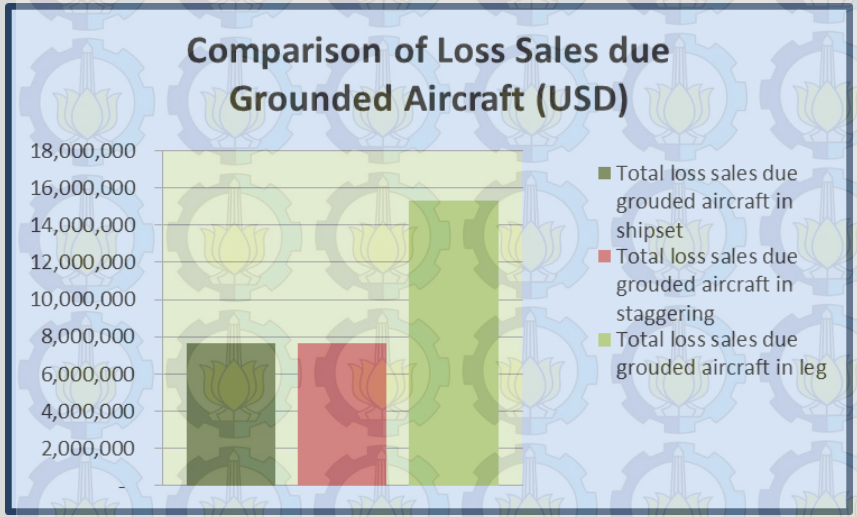
THANK YOU

GAME THEORY

- Von Neumann Equilibrium point : equilibrium point or value of game in the beginning of the game before there is any agreement between players

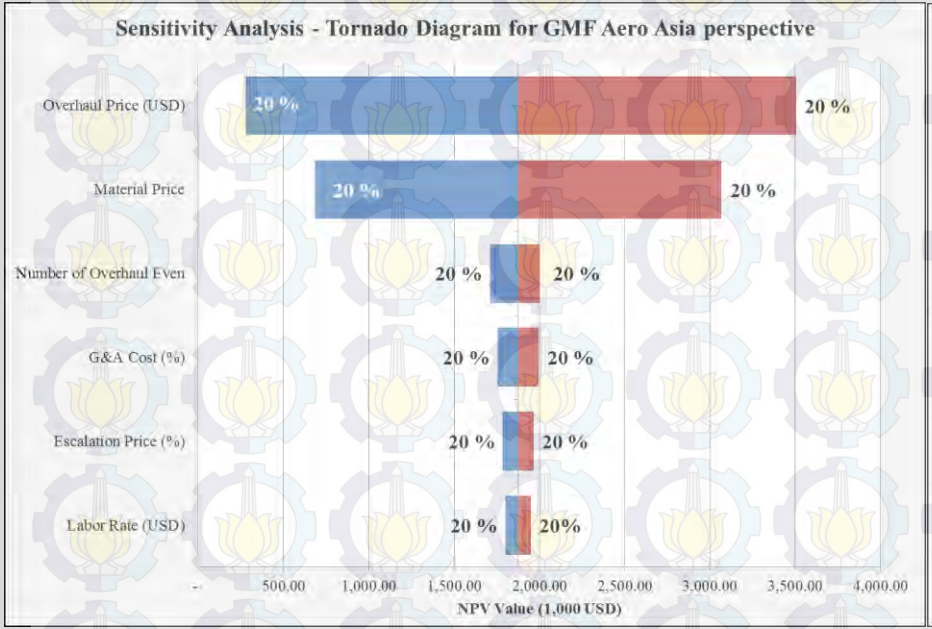
- Nash Equilibrium point : equilibrium point or new value of the game that exist after there is agreement between players.

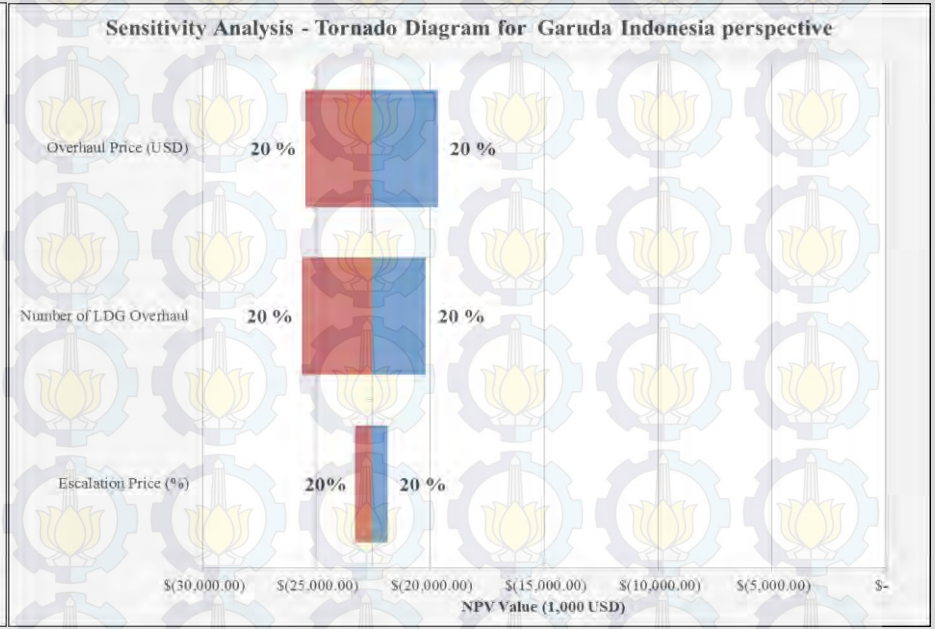
Domination



Offloaded work in shipset scenario			
Year	1 spare	2 spares	3 spares
2014	0	0	0
2015	0	0	0
2016	0	0	0
2017	0	0	0
2018	7	2	0
2019	15	10	8
2020	4	0	0
2021	1	0	0

Tornado Diagram





Critical Point

Critical Point		
NPV value	**$ 1,300,000**	**0**
Escalation Price (%)	6.12%	9.444%
LDG Price (USD)	$ 1,362,529	-
Labor Rate (USD)	$ 49.14	$ 177.28
Number of Overhaul Even	38	-
Overhaul Price (USD)	$ 384,214	$ 305,287.06
G&A Cost (%)	7.21%	21.37%

Critical Point	
Escalation Price (%)	8.00%
Number of LDG Overhaul	71
Overhaul Price (USD)	$ 459,892.13
Maintenance Fee Third Party	$ 317,832.55

Chosen Scheme for Each Perspective

Scenario 9	
Maintenance Schedule	Staggering Scenario
Number of Spare	3 spares
Ownership	2 invest
	1 rent
NPV	$ 2,361,523

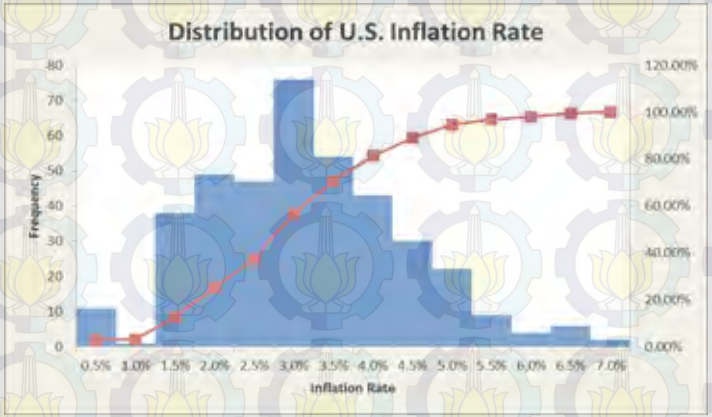
Scenario 1	
Maintenance Schedule	Shipset Scenario
Number of Spare	2 spares
Ownership	1 invest
	1 rent
NPV	$ (22,397,875)

- GMF's revenue from this Staggering Scenario -USD 23,704,482- is higher compared with shipset scenario -USD 20,993,072-
- Furthermore, by using three spares will increase the maximum capacity to 12 LDGs.

- In shipset scenario, aircrafts that done overhaul in GMF is 38 aircrafts that equals to (USD 20,248,531) and 12 aircrafts will be done by using third party service or equals with (USD 4,813,200). Total cost for overhaul is (USD 25,061,731). In the other hand, when Garuda uses staggering scenario, total cost is (USD 26,197,056) or (USD 1,135,325) higher than shipset total fee.

Data buat risk

- Inflation



- Labor rate

Personnel Costs [30]	
Captain Salary	$55,754
First Officer Salary	$39,166
Maintenance Tech Salary	$39,128

The difference between fair scheme and best scheme for each perspective

Scenario 2	
Maintenance Schedule	Shipset Scenario
Number of Spare	2 spares
Ownership	2 invest
	-
NPV	$ 1,850,089
Difference	$ 511,434

Scenario 2	
Maintenance Schedule	Shipset Scenario
Number of Spare	3 spares
Ownership	2 invest
	-
NPV	$ 1,850,089

Difference	$ 511,434

Scenario 1	
Maintenance Schedule	Shipset Scenario
Number of Spare	2 spares
Ownership	1 invest
	1 rent
NPV	$ (22,397,875)

Scenario 2	
Maintenance Schedule	Shipset Scenario
Number of Spare	2 spares
Ownership	2 invest
	-
NPV	$ (22,568,239)

Difference	$ 170,364

The comparison between scheme 2, 7, 10

Best GIA	$	(22,397,874)
Best GMF	$	2,361,522

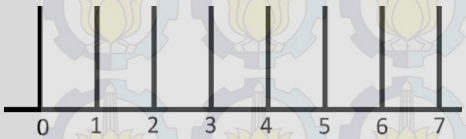
Scenario 2		
GMF Aero Asia	$	511,433
Garuda Indonesia	$	170,365

Scenario 7		
GMF Aero Asia	$	177,811
Garuda Indonesia	$	1,198,069

Scenario 10		
GMF Aero Asia	$	501,143
Garuda Indonesia	$	262,995

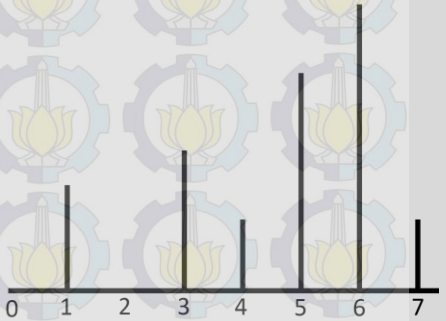
Payment Scheme

GIA



i = 2%

Third Party
Fund Manager



GMF